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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

First Named Inventor	: Michael W. Pfeiffer et al.	Appeal No.
Appln. No.	: 09/129,468	
Filed	: August 4, 1998	Group Art Unit: 3729
For	: ASSEMBLY DEVICE FOR COMPONENTS OF A DATA STORAGE SYSTEM AND METHOD OF ASSEMBLY THEREFOR	Examiner: Minh N. Trinh
Docket No.:	S01.12-0448	

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PATENT ATTORNEY

Sir:

This is an appeal from an Office Action dated July 14, 2003 in which claims 1-3, 21 and 27-28 were finally rejected and dependent claims 4-15 and 22 were objected to as being dependent upon a rejected base claim.

REAL PARTY INTEREST

Seagate Technology LLC, a corporation organized under the laws of the state of Delaware, and having offices at 920 Disc Drive, Scotts Valley, CA 95066, has acquired the entire right, title and interest in and to the invention, the application, and any and all patents to be obtained therefor, as set forth in the Assignment filed with the patent application and recorded on Reel 9368, frame 0815.

RELATED APPEALS AND INTERFERENCES

There are no known related appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

STATUS OF THE CLAIMS

I. Total number of claims in the application.

Claims in the application are: 23

II. Status of all the claims.

A.	Claims pending:	1-15 and 21-28
B.	Claims cancelled:	16-20
C.	Claims appealed:	1-3, 21, 27 and 28
D.	Claims allowed:	23-26
E.	Claims objected to:	4-15 and 22

III. Claims on appeal

The claims on appeal are: 1-3, 21, 27 and 28

STATUS OF AMENDMENTS

Appellants did not file an Amendment after Final.

SUMMARY OF INVENTION

The present invention relates to a high capacity assembly apparatus. As shown carousels 158-1, 158-2, 154 support a plurality of assembly components for assembly. The carousels 154, 158-1, 158-2 are removably coupled to a carousel base 170 rotationally coupled to the frame 152 via a carousel coupling device. (Applicants' specification, Page 10, lines 1-20). The carousels 154, 158-1, 158-2 are removably coupled to the apparatus for continuous assembly operation without interruption to load components. (Applicants' specification, Page 5, lines 19-23). In particular, in one embodiment illustrated in FIG. 7, the carousel base 170 includes a vacuum lock assembly 262 coupled to a vacuum source 269 to provide a carousel coupling device to removably couple carousel 154, 158-1, 158-2 to the carousel base 170. A vacuum is selectively supplied to engage and disengage carousels 154, 158-1, 158-2 to removably couple carousels 154, 158-1, 158-2 to the carousel base 170 for assembly operations.

As illustrated in FIG. 5, the embodiment of the apparatus includes a plurality of containers removably coupled to carousels 158-1, 158-2 to load components onto the carousels for assembly. The plurality of containers are removably secured to the carousels 158-1, 158-2 via a plurality of latch assemblies 236. Thus, disc or components are loaded onto the carousels for assembly without unloading the discs from containers 172 or individually handling the discs to limit damage caused by excessive handling. (Applicants' specification, Page 9, lines 30-33) This provides advantages over prior carousels requiring that assembly components or discs be individually loaded onto the carousel for assembly.

ISSUES

I. Whether the Office Action and/or record establishes a *prima facie* basis to reject claims 1-3, 21 and 27-28 based upon Chuang under 35 U.S.C.§102(e); and

GROUPING OF CLAIMS

The following groupings of claims are made solely in the interest of consolidating issues and expediting this Appeal. No grouping of claims is intended to be nor should be interpreted as being any form of admission or a statement as to the scope or obviousness of any limitation. The claims of each group do not stand or fall together.

Group I	Claims 1, 2 and 27;
Group II	Claim 3;
Group III	Claim 28; and
Group IV	Claim 21.

ARGUMENT

I. Claims 1-3 and 27-28 are patentable over Chuang

Claims 1-3 and 27-28 recite *inter alia* a frame, a base rotationally coupled to the frame and a carousel coupling device to removably couple a carousel to the carousel base and were rejected under 35 U.S.C. § 102(e) based upon Chuang. *See* Office Actions of February 24, 2003 and July 14, 2003. The record does not establish a *prima facie* basis for rejecting claims 1-3 and 27-28 based upon Chuang as follows.

A. Rejection of claims 1-3 and 27-28 on the basis that Chuang discloses "a coupling device for attaching or coupling a carousel base to a frame . . . or removable base" is erroneous.

Claims 1-3 and 27-28 were rejected on the basis that Chuang discloses "a carousel coupling device that couples the carousel base (or "removable base" - Advisory Action - Paper No. 25) to the frame 278. See Office Action dated February 24, 2003, page 4 and Office Action dated July 14, 2003, page 2. Rejection of claims 1-3 and 27-28 on the basis of a coupling device for attaching a carousel base to a frame (or removable base) fails to establish a *prima facie* basis for rejecting claims reciting a carousel base rotationally coupled to a frame and a coupling device to removable couple a **carousel** to the **carousel base** rotationally coupled to the frame. The record states that Chuang teaches a "carousel with base" but does not set forth that Chuang discloses a device to removably couple the carousel to the base as recited in claims 1-3 and 27-28. Reliance on a coupling between a carousel base and frame or removable base does not establish a *prima facie* basis to support rejection of a coupling for a carousel to a carousel base which is rotationally coupled to a frame as claimed.

B. Claims 1-3 and 27-28 have been rejected without specific reference to structure corresponding to each of the recited claim elements.

Claims 1-3 and 27-28 were rejected on the basis of a marked-up version of Chuang FIG. 10. *See* Paper No. 23. Mark-up version of FIG. 10 references a frame, a carousel, a base and latches and includes a reference to see Col. 17, lines 10-30, but does not include a reference to a carousel coupling device to removably couple a carousel to a carousel base as claimed. Col. 17, lines 10-30 recites

> Returning to FIG. 10, the shim selector assembly 290 has a rotating carousel 316 which holds a number of differently weighted shims 314 on appropriately dimensioned vertically standing rod supports. The carousel 316 is rotated by a motor (not shown) to present the desired shim 314 to a pick and place robotic arm 318. The robotic arm 318 supportingly engages the desired shim 314 in the carousel 316 and with a vacuum assisted end effector (which is not shown but which is of conventional construction) picks the shim 314 from the carousel 316 and delivers the shim 314 to the shim attachment assembly 296.
>
> The embodiment of the present invention as illustrated by FIG. 10 uses a carousel 316 which holds ten stacks of shims 314, so as many as ten differently weighted shims 314 can be stored in the carousel 316. From FIG. 12 it will be noted that the characteristic imbalance of a particular shim 314 is determined by the width of a gap 319 in the shim 314. For this embodiment of the invention it has been determined that weighted shims 314

> ranging in imbalance from 11.9 mg-in to 69.5 mg-in provide a sufficient range of shim weights. . . Col 17, lines 10-30

Reference in the record to Col. 17, lines 10-30 as set forth above does not set forth structure corresponding to a carousel base rotationally coupled to a frame and a carousel coupling device to removably couple a carousel to the carousel base as claimed.

C. The record fails to establish a *prima facie* basis to reject claim 3.

Claim 3 is dependent upon claim 1 and further recites that the carousel coupling device comprises a vacuum source operably coupled to the rotatable carousel base to supply vacuum pressure in an engaged mode to secure the component carousel to the carousel base and to release the vacuum pressure to remove the component carousel. Claim 3 was further rejected on the basis that Chuang discloses a vacuum operably associated with the carousel base (see discussion of Col. 17, line 17-18) Col. 17, lines 17-18 of Chuang disclose a robotic arm to engage shims on a carousel with a vacuum-assisted end effector to pick shims from a carousel 316, but does not teach or suggest a coupling device operable between a carousel and carousel base rotationally coupled to a frame comprising a vacuum source as claimed.

D. The record fails to establish a *prima facie* basis to reject claim 28.

Claim 28 is dependent on claim 27 and further recites a component carousel including a plurality of latching assemblies to removably couple a plurality of component containers thereto. Claim 28 was rejected on the basis that Chuang et al. "inherently

disclose a plurality of latching assemblies being coupled to a plurality of component containers" on the basis that the "attached assembly (316) of the reference read [sic] on the claimed carousel including plurality latching [sic] coupled to a plurality of containers as claimed in the instant claim 28" as set forth in the Office Action dated July 14, 2003 and marked-up FIG. 10 attached thereto. Marked-up FIG. 10 includes an Examiner notation to latches but the record and FIG. 10 do not make reference to a plurality of latching assemblies to removably couple a plurality of component containers to a carousel as claimed.

E. Conclusion

Based upon the foregoing the record fails to establish a *prima facie* basis for rejecting the particular structure claimed, and thus rejection of claims 1-3 and 27-28 is erroneous and should be withdrawn.

II. The record fails to establish a *prima facie* basis to reject means-plus-function claim 21.

Claim 21 is a means plus function claim which recites *inter alia* a means for intermittently stocking an assembly apparatus with a supply of components for assembly by the assembly arm. Claim 21 was rejected on the basis that Chuang teaches a means for intermittently stocking a carousel with a supply of components (See Col. 17, lines 15-20, Col. 28, lines 41-44 of Chuang) without regard to the recited claim language and the corresponding structure disclosed in Applicants' specification. *See* Office Action of February 24, 2003, page 5. As described in Applicants' specification, Applicants provide a removable carousel to intermittently restock components for assembly. Pursuant to *In Re Donaldson* and the Supplemental Examination Guidelines of June 2000, means-plus-function language in a claim must be interpreted based upon the corresponding structure disclosed in the

specification and equivalents. *In re Donaldson,* 29 U.S.P.Q.2d 1845 (Fed. Cir. 1994).

Claim 21 was rejected on the basis of FIGS. 10-11, Col 17, lines 15-20, Col 28, lines 41-44 of Chuang. Col. 17, lines 15-20 and Col 28, lines 41-44 of Chuang teach a robotic arm 318 including a vacuum assisted end effector for moving or picking up shims from a carousel or unloading components for assembly. In contrast, claim 21 recites a means for intermittently stocking (as opposed to unloading) the assembly with a supply of components for assembly by the assembly arm. Claim 21 was rejected as above with respect to the robotic assembly arm and end effector of Chuang for unloading components without regard to the recited claim language and the corresponding structure disclosed in Applicants' specification and equivalents. Proper consideration of claim 21 is respectfully requested.

Based upon the foregoing, Applicants respectfully request allowance of pending claims 1-15 and 21-26.

Respectfully submitted,

WESTMAN, CHAMPLIN & KELLY, P.A.

By: Deirdre Kvale

Deirdre Megley Kvale, Reg. No. 35,612
Suite 1600 - International Centre
900 Second Avenue South
Minneapolis, Minnesota 55402-3319
Phone:(612) 334-3222 Fax:(612) 334-3312

DMK:lah

Appendix A

1.(Previously Presented) An assembly apparatus comprising:

a frame;

a carousel base rotationally coupled to the frame;

a carousel coupling device to removably couple a component carousel including a plurality of assembly components to the carousel base;

an assembly arm movably coupled to the frame; and

a driver coupled to the assembly arm to move the assembly arm between first and second positions to sequentially unload the plurality of assembly components from the component carousel and assemble the unloaded assembly components.

2.(Previously Presented) The assembly apparatus of claim 1 wherein the component carousel supports a plurality of stacks of the plurality of assembly components at spaced locations arranged about a center point and further comprising:

a motor coupled to the carousel base to rotationally position the plurality of stacks of assembly components for assembly.

3.(Previously Presented) The assembly apparatus of claim 1 wherein the carousel coupling device comprises a vacuum source operably coupled to the rotatable carousel base to supply vacuum pressure in an engaged mode to secure the component carousel to the carousel base and to release the vacuum pressure to remove the component carousel.

4.(Previously Presented) The assembly apparatus of claim 2 further comprising an indexer coupled to the carousel base to align individual components from the plurality of stacks of the plurality of assembly components relative to the assembly arm.

5.(Previously Presented) The assembly apparatus of claim 1 and further comprising the component carousel including a plurality of elongated component containers configured to contain the plurality of assembly components removably coupleable to the component carousel and positionable at spaced locations about a rotation axis of the carousel base.

6.(Previously Presented) The assembly apparatus of claim 1 wherein the apparatus includes a plurality of carousel bases rotationally coupled to the frame and a plurality of carousel coupling devices to removably support multiple component carousels relative to the plurality of carousel bases and the driver moves the assembly arm between the plurality of carousel bases to unload the multiple component carousels on the plurality of carousel bases.

7.(Previously Presented) The assembly apparatus of claim 1 and further comprising the component carousel and the component carousel containing discs for assembly in a spindle motor of a data storage device.

8. (Previously Presented) The assembly apparatus of claim 7 wherein the component carousel containing discs includes a plurality of spaced latch assemblies about a circumference of the component carousel containing discs to removably connect a plurality of disc containers storing a plurality of stacked discs to the component carousel at concentric spaced locations.

9.(Previously Presented) The assembly apparatus of claim 8 wherein the plurality of disc containers include covers and the apparatus includes a cover detatcher to detach the disc container covers prior to assembling discs from the plurality of disc

containers.

10.(Previously Presented) The assembly apparatus of claim 1 and comprising the component carousel and the component carousel containing spacers for assembly in a spindle motor of a data storage device.

11.(Previously Presented) The assembly apparatus of claim 1 wherein the apparatus is adapted to assembly components of a disc stack of a spindle motor and further comprising:

a plurality of carousel bases including a carousel base adapted to support a component carousel for discs and a carousel base adapted to support a component carousel for spacers;

a plurality of assembly arms including an assembly arm coupled to the carousel base adapted to support the component carousel for discs to assemble discs and an assembly arm coupled to the carousel base adapted to support the component carousel for spacers to assemble spacers;

a plurality of drivers coupled to the plurality of assembly arms to move the plurality of assembly arms between the plurality of carousel bases and a loading station; and

a controller coupled to the plurality of drivers to coordinate operation of the plurality of assembly arms to alternately assemble the discs and the spacers.

12.(Previously Presented) The assembly apparatus of claim 11 and comprising the component carousel for discs and the component carousel for discs including a plurality of circumferentially

spaced latch assemblies to removably couple a plurality of disc containers to the component carousel for discs.

13.(Previously Presented) The assembly apparatus of claim 12 wherein the disc containers house a stack of coaxially aligned unassembled discs and the assembly apparatus further comprises an indexer to incrementally position the carousel base adapted to support the component carousel for discs to sequentially unload individual discs in the stack of unassembled discs.

14.(Previously Presented) The assembly apparatus of claim 11 and comprising a component carousel for spacers including a plurality of spacer posts arranged about a center point and sized to support a plurality of stacked spacers and including a motor coupled to the carousel base to move the component carousel for spacers to align the plurality of stacked spacers for assembly.

15.(Previously Presented) The assembly apparatus of claim 14 further comprising an index rod operably coupled to the component carousel for spacers to push the spacers towards an extended end of the spacer posts for assembly.

16.(Canceled)

17.(Canceled)

18.(Canceled)

19.(Canceled)

20.(Canceled)

21.(Previously Presented) An assembly apparatus comprising:

an assembly arm and assembly arm driver operably coupled to the assembly arm to operate the assembly arm to unload components from the assembly apparatus and load components in an unassembled device; and

means for intermittently stocking the assembly apparatus with a supply of the components for assembly by the assembly arm.

22.(Previously Presented) The assembly apparatus of claim 6 wherein the apparatus includes a detector to detect when the multiple component carousels are empty and the assembly arm is coupled to a controller which is configured to shift operation of the assembly arm from one of the multiple component carousels to another of the multiple component carousels supported on the plurality of carousel bases based upon feedback from the detector.

23.(Previously Presented) An assembly apparatus comprising:

a frame;

a plurality of carousel bases rotationally coupled to the frame and rotatable about spaced rotation axes;

an assembly arm movably coupled to the frame;

an assembly arm driver coupled to the assembly arm to operate the assembly arm to unload components from carousels coupled to the plurality carousel bases; and

a controller operably coupled to the assembly arm and configured to sequentially operate the assembly arm between the plurality of carousel bases.

24.(Previously Presented) The assembly apparatus of claim 23 wherein the plurality of carousel bases support disc carousels and further comprising a plurality of disc unloaders coupled to the

plurality of carousel bases and the plurality of carousel bases including an elevator coupled to the plurality of carousel bases to position sequential staked discs on the disc carousels relative to the plurality of disc unloaders.

25.(Previously Presented) The assembly apparatus of claim 23 including a plurality of disc carousels removably coupled to the plurality of carousel bases and the plurality of disc carousels removably supporting a plurality of disc containers including a plurality of stacked discs.

26. (Previously Presented) The assembly apparatus of claim 25 wherein the plurality of disc containers are removably supported by a plurality of latch assemblies.

27.(Previously Presented) An assembly apparatus comprising:

a frame;

a carousel base rotationally coupled to the frame;

a carousel coupling device to removably couple a component carousel including a plurality of assembly components to the carousel base; and

an assembly arm movably coupled to the frame to unload the plurality of assembly components from the component carousel removably coupled to the base.

28.(Previously Presented) The assembly apparatus of claim 27 and further comprising:

a component carousel including a plurality of latching assemblies to removably couple a plurality of component containers thereto.